

What Is Claimed Is:

1 1. A method of processing a command requesting information on any intermediate layer-2
2 devices present in a route from a first system to a second system, said any intermediate devices being
3 contained in a network implemented on a broadcast medium, said network containing a plurality of
4 devices including said any intermediate devices, said method comprising:

5 receiving said command;

6 determining a first layer-2 device which is connected directly to said first system, logically
7 viewing said first layer-2 device as a present layer-2 device if said second system is also not directly
8 connected to said first layer-2 device;

9 sending a request packet to said present layer-2 device requesting information on whether said
10 second system is connected directly to said system;

11 receiving a response packet from said present layer-2 device, wherein said response packet
12 indicates whether said second system is connected directly to said present layer-2 device, wherein said
13 response packet further identifies a subsequent layer-2 device in a route to said second system if said
14 second system is not connected directly to said present layer-2 device, wherein said subsequent layer-2
15 device is next to said present layer-2 device in said route to said second system; and

16 repeating said sending and receiving by using said subsequent layer-2 device in the place of said
17 present layer-2 device until said response packet indicates that said second system is directly connected
18 to said presently layer-2 device.

1 2. The method of claim 1, wherein a receiving device receives said command, and wherein said
2 receiving device is not directly connected to said first layer-2 device, wherein said determining further
3 comprises:

4 locating a directly connected device which is connected directly to said first system;
5 using said directly connected device as said present layer-2 device; and
6 performing said repeating to determine said route.

1 3. The method of claim 2, wherein said locating comprises:
2 substituting said receiving device as said first layer-2 device; and
3 performing said repeating to determine said directly connected device.

4 4. The method of claim 2, wherein said locating comprises sending a multicast packet directed
to said plurality of devices, said multicast packet containing an identifier of said source system, wherein
each of said plurality of devices is designed to respond indicating if said source system is connected
directly to the device.

5 5. The method of claim 1, wherein said determining, sending, receiving, and repeating are
2 performed in a receiving device.

1 6. The method of claim 5, further comprising providing a command line interface to enable a
2 network administrator to enter said command on said receiving device.

1 7. The method of claim 1, wherein said second system is deemed to be directly connected to
2 said first layer-2 device if said system is connected to a port of said first layer-2.

1 8. The method of claim 7, further comprising:

receiving in said receiving device a neighbor packet from a neighbor device on at least one port;

and

concluding in said receiving device that a system communicating on another port is connected directly to said another port by the absence of reception of neighbor packets on said another port.

9. The method of claim 8, wherein said network is implemented using Ethernet/802.3 protocol.

10. The method of claim 1, wherein said request packet and said response packet are generated consistent with UDP/IP protocol.

11. The method of claim 1, wherein said determining, sending, receiving, and repeating are performed in a computer system.

12. A method of supporting the tracing of a route containing a sequence of layer-2 devices between a first system and a second system, said method being performed in a device forming a part of a network, said method comprising:

receiving in said device a request packet containing an identifier for said second system, wherein said request packet requests information on whether said second system is connected directly to said device;

determining in said device whether said device is connected directly to said system;

generating in said device a response packet, wherein said response packet indicates whether said device is connected directly to said device; and

sending from said device said response packet.

1 13. The method of claim 12, wherein said generating further comprises:

2 identifying in said device a next device, wherein said next device is next to said device in a route
3 from said source system to said destination system; and
4 including data identifying said next device in said response packet.

1 14. The method of claim 13, wherein said identifying comprises:

2 examining a table in said device to determine a port on which said destination device
3 communicates; and
4 locating a device connecting on said port, wherein said located device comprises said next
5 device.

1 15. The method of claim 14, wherein said locating comprises:

2 receiving a neighbor packet from said next device on said port indicating a next device identifier
3 identifying said next device; and
4 including said next device identifier in said response packet.

1 16. The method of claim 15, wherein said first system is deemed to be connected directly to
2 said device if said first system is present on a port of said device, wherein determining is based on the
3 absence of reception of said neighbor packet on said port.

1 17. A device/system processing a command requesting information on any intermediate layer-2
2 devices present in a route from a first system to a second system, said any intermediate devices being

3 contained in a network implemented on a broadcast medium, said network containing a plurality of
4 devices including said any intermediate devices, said device/system comprising:

5 means for receiving said command;

6 means for determining a first layer-2 device which is connected directly to said first system,
7 logically viewing said first layer-2 device as a present layer-2 device if said second system is also not
8 directly connected to said first layer-2 device;

9 means for sending a request packet to said present layer-2 device requesting information on
10 whether said second system is connected directly to said system;

11 means for receiving a response packet from said present layer-2 device, wherein said response
12 packet indicates whether said second system is connected directly to said present layer-2 device,
13 wherein said response packet further identifies a subsequent layer-2 device in a route to said second
14 system if said second system is not connected directly to said present layer-2 device, wherein said
15 subsequent layer-2 device is next to said present layer-2 device in said route to said second system;
16 and

17 , means for repeating said sending and receiving by using said subsequent layer-2 device in the
18 place of said present layer-2 device until said response packet indicates that said second system is
19 directly connected to said presently layer-2 device.

1 18. The system/device of claim 17, wherein a receiving device receives said command, and
2 wherein said receiving device is not directly connected to said first layer-2 device, wherein said means
3 for determining further comprises:

4 means for locating a directly connected device which is connected directly to said first system;

5 means for using said directly connected device as said present layer-2 device; and

performing said repeating to determine said route.

19. The system/device of claim 18, wherein said means for locating comprises:

means for substituting said receiving device as said first layer-2 device; and

means for performing said repeating to determine said directly connected device.

20. The system/device of claim 18, wherein said means for locating comprises sending a

multicast packet directed to said plurality of devices, said multicast packet containing an identifier of said source system, wherein each of said plurality of devices is designed to respond indicating if said source system is connected directly to the device.

21. A device for supporting the tracing of a route containing a sequence of layer-2 devices between a first system and a second system, said device being comprised in a network based on broadcast medium, said device comprising:

means for receiving in said device a request packet containing an identifier for said second system, wherein said request packet requests information on whether said second system is connected directly to said device;

means for determining in said device whether said device is connected directly to said system;

means for generating in said device a response packet, wherein said response packet indicates whether said device is connected directly to said device; and

means for sending from said device said response packet.

22. The device of claim 21, wherein said means for generating further comprises:

means for identifying in said device a next device, wherein said next device is next to said device in a route from said source system to said destination system; and
means for including data identifying said next device in said response packet.

23. The device of claim 22, wherein said means for identifying comprises:

means for examining a table in said device to determine a port on which said destination device communicates; and
means for locating a device connecting on said port, wherein said located device comprises said next device.

24. The device of claim 23, wherein said means for locating comprises:

means for receiving a neighbor packet from said next device on said port indicating a next device identifier identifying said next device; and
means for including said next device identifier in said response packet.

25. The device of claim 23, wherein said first system is deemed to be connected directly to said device if said first system is present on a port of said device, wherein determining is based on the absence of reception of said neighbor packet on said port.

26. A computer readable medium carrying one or more sequences of instructions for causing a device to process a command requesting information on any intermediate layer-2 devices present in a route from a first system to a second system, said any intermediate devices being contained in a network implemented on a broadcast medium, said network containing a plurality of devices including

8 said any intermediate devices, wherein execution of said one or more sequences of instructions by one
9 or more processors contained in said device causes said one or more processors to perform the actions
10 of:

11 receiving said command;

12 determining a first layer-2 device which is connected directly to said first system, logically
13 viewing said first layer-2 device as a present layer-2 device if said second system is also not directly
14 connected to said first layer-2 device;

15 sending a request packet to said present layer-2 device requesting information on whether said
16 second system is connected directly to said system;

17 receiving a response packet from said present layer-2 device, wherein said response packet
18 indicates whether said second system is connected directly to said present layer-2 device, wherein said
19 response packet further identifies a subsequent layer-2 device in a route to said second system if said
20 second system is not connected directly to said present layer-2 device, wherein said subsequent layer-2
21 device is next to said present layer-2 device in said route to said second system; and

22 repeating said sending and receiving by using said subsequent layer-2 device in the place of said
23 present layer-2 device until said response packet indicates that said second system is directly connected
24 to said presently layer-2 device.

1 27. The computer readable medium of claim 26, wherein said command is received in a
2 receiving device, wherein said receiving device is not directly connected to said first layer-2 device,
3 wherein said determining further comprises:

4 locating a directly connected device which is connected directly to said first system;

5 using said directly connected device as said present layer-2 device; and

6 second performing said repeating.

1 28. The computer readable medium of claim 27, wherein said locating comprises:
2 substituting said receiving device as said first layer-2 device;
3 third performing said repeating;
4 using a last one of said present-layer 2 determined by said third performing as said directly
5 connected device.

1 29. The computer readable medium of claim 27, wherein said locating comprises sending a
2 multicast packet directed to said plurality of devices, said multicast packet containing an identifier of
3 said source system, wherein each of said plurality of devices is designed to respond indicating if said
4 source system is connected directly to the device.

1 30. The computer readable medium of claim 26, wherein said determining, sending, receiving,
2 and repeating are performed in said receiving device.

1 31. The computer readable medium of claim 30, further comprising providing a command line
2 interface to enable a network administrator to enter said command on said receiving device.

1 32. The computer readable medium of claim 26, wherein said second system is deemed to be
2 directly connected to said first layer-2 device if said system is connected to a port of said first layer-2.

1 33. The computer readable medium of claim 32, further comprising:

receiving in said receiving device a neighbor packet from a neighbor device on at least one port;

and

concluding in said receiving device that a system communicating on another port is connected directly to said another port by the absence of reception of neighbor packets on said another port.

34. The computer readable medium of claim 33, wherein said network is implemented using Ethernet/802.3 protocol and said request packet and said response packet are generated consistent with UDP/IP protocol.

35. A computer readable medium carrying one or more sequences of instructions for causing a device to support the tracing of a route containing a sequence of layer-2 devices between a first system and a second system, said device being comprised in a network based on broadcast medium, wherein execution of said one or more sequences of instructions by one or more processors contained in said device causes said one or more processors to perform the actions of:

receiving in said device a request packet containing an identifier for said second system, wherein said request packet requests information on whether said second system is connected directly to said device;

determining in said device whether said device is connected directly to said system;

generating in said device a response packet, wherein said response packet indicates whether said device is connected directly to said device; and

sending from said device said response packet.

36. The computer readable medium of claim 35, wherein said generating further comprises:

identifying in said device a next device, wherein said next device is next to said device in a route from said source system to said destination system; and including data identifying said next device in said response packet.

37. The computer readable medium of claim 36, wherein said identifying comprises: examining a table in said device to determine a port on which said destination device communicates; and locating a device connecting on said port, wherein said located device comprises said next device.

38. The computer readable medium of claim 37, wherein said locating comprises: receiving a neighbor packet from said next device on said port indicating a next device identifier identifying said next device; and including said next device identifier in said response packet.

39. A device for supporting the tracing of a route containing a sequence of layer-2 devices between a first system and a second system, said device being comprised in a network based on broadcast medium, said device comprising: an inbound interface receiving a request packet containing an identifier for said second system, wherein said request packet requests information on whether said second system is connected directly to said device; a next hop block determining whether said device is connected directly to said system;

8 a generate request/response block generating a response packet, wherein said response packet
9 indicates whether said device is connected directly to said device; and
10 an outbound interface sending said response packet.

1 40. The device of claim 39, further comprising:
2 a memory storing a first table and a second table, said first table indicating a port on which each
3 system communicates, said second table indicating a device connecting to each port; and
4 a port determination block determining a port on which said second system communicates,
5 wherein said next hop block examines said second table to determine said a next device
6 according to the port determined by said port determination block, wherein said next device is
7 contained in said sequence of layer-2 devices.

1 41. The device of claim 40, wherein said next hop block determines that said second system
2 is directly connected to a first port indicated by said first table if no device is associated with said first
3 port in said second table.

1 42. The device of claim 39, further comprising an user interface receiving said a trace
2 command from a network administrator.

1 43. The device of claim 42, wherein said device is not directly connected to said first system,
2 said device further comprising a control logic to trace a directly connecting device connecting directly
3 to said first system, wherein said route is traced from said directly connecting device using said inbound
4 interface, said outbound interface, said next hop block and said generate request/response block.

1 44. The device of claim 42, wherein said device is not directly connected to said first system,
2 said device further comprising a control logic to trace a directly connecting device connecting directly
3 to said first system by sending a multicast packet.

1 45. The device of claim 39, further comprising a response processor to receive a response
2 packet, wherein said response packet indicates a next device in said route, wherein said generate
3 request/response block generates another request packet directed to said next device, wherein said
4 another request packet requests said next device to indicate whether said second system is connected
5 directly to said next device.